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**LA THÈSE A ÉTÉ  
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Frequency Judgements of Grade 2 and Grade 5 Children  
For Sex-role Related Information

by

Diane J. Zanier

A thesis  
presented to the University of Windsor  
in fulfillment of the  
thesis requirement for the degree of  
Master of Arts  
in —  
Psychology

Windsor , Ontario, 1985



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## ABSTRACT

The present study was initiated to demonstrate that children's sex-role stereotypes can have a biasing effect on their processing of sex-role related information. Grade 2 and grade 5 children were shown a series of slides depicting a male and female actors engaged in masculine, feminine and neutral activities (e.g., boxing, sewing, reading, respectively). Children saw actor-activity pairs that were: (1) consistent with stereotypes (traditional pictures, e.g., a male boxing), (2) inconsistent with stereotypes (nontraditional pictures, e.g., a female actor boxing) and (3) unrelated to stereotypes (neutral pictures, e.g., a male reading). The biasing effect was demonstrated in two ways. First, when traditional pictures were presented the same number of times as nontraditional pictures (e.g., 1, 2, 3 or 4 times), children reported that they saw the traditional pictures (e.g., a female actor ironing) more frequently than the nontraditional pictures (e.g., a male actor ironing). Secondly, when children were shown more traditional pictures (e.g., a male sawing, 4 times) than nontraditional pictures (e.g., a female sawing, 1 time) (congruent condition because such information is consistent with the sex schema notion that males saw more frequently than females), children were

relatively accurate at reporting that the traditional portrayals occurred more often than the nontraditional portrayals. However, when children were shown more nontraditional pictures (e.g., a male ironing, 4 times) than traditional pictures (e.g., a female ironing, 1 time) (incongruent condition because such information is inconsistent with the knowledge that females iron more often than males), children had difficulty recalling events correctly. When the number of nontraditional to traditional events was 4 to 1, children recalled seeing traditional and nontraditional events about equally frequently. When the number of nontraditional to traditional events was 3 to 2, children reported seeing more traditional than nontraditional events. No age-related differences emerged in terms of the biasing effect on processing of information. However, the biasing effect was noted to be stronger for boys than girls. An empirical question was also tested in the present study. The interest was in seeing whether children's frequency judgements for stereotype-unrelated (neutral) information would be like frequency judgements for stereotype-consistent or inconsistent events. Findings indicated that when each of the three types of pictures was presented equally often (1, 2, 3 or 4 times), the general trend was for children to assign higher estimates to the neutral than inconsistent pictures, but similar estimates to the neutral and consistent pictures. The findings of the

present study were discussed in terms of how the biasing effect can lead to strengthening of stereotypes. Speculation of why the biasing effect would emerge was also considered.

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Finally, I am indebted to my family and friends for their constant support. To Doris, David, Angela and Luigi-- thank-you for always being there. Non potrebero mai ringraziarvi abbastanza per vostra pazienza e vostro



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## CONTENTS

ABSTRACT . . . . .	ii
ACKNOWLEDGEMENTS . . . . .	v
LIST OF TABLES . . . . .	vii
LIST OF FIGURES . . . . .	viii

<u>Chapter</u>	<u>Page</u>
I. INTRODUCTION . . . . .	1
II. METHOD . . . . .	8
Subjects . . . . .	8
Materials and Apparatus . . . . .	8
Procedure . . . . .	12
III. RESULTS . . . . .	14
Questionnaire Results . . . . .	14
Sex-typed Activities . . . . .	15
Traditional, Nontraditional and Neutral Events . . . . .	29
IV. DISCUSSION . . . . .	32

<u>Appendix</u>	<u>Page</u>
A. REVIEW OF LITERATURE . . . . .	43
Martin and Halverson's Model . . . . .	43
The First Proposition . . . . .	45
The Second Proposition . . . . .	50
Summary . . . . .	55
B. STIMULI PICTURES . . . . .	58
BIBLIOGRAPHY . . . . .	67

VITA AUCTORIS . . . . . 70

# LIST OF TABLES

Table		Page
1	Mean Frequency Judgement Scores For Congruent and Incongruent Conditions Under the Frequency Conditions of 1 and 4: Masculine and Feminine Activities Separately	20
2	Mean Frequency Judgement Scores For Congruent and Incongruent Conditions Under the Frequency Conditions of 1 and 4: Boys and Girls Separately	23
3	Mean Frequency Judgement Scores For Congruent and Incongruent Conditions Under the Frequency Conditions of 2 and 3: Masculine and Feminine Activities Separately	25
4	Mean Frequency Judgement Scores For Congruent and Incongruent Conditions Under the Frequency Conditions of 2 and 3: Boys and Girls Separately	27
5	Mean Frequency Judgement Scores For Traditional Nontraditional and Neutral Actor-Activity Pairs Under Frequency Conditions of 1, 2, 3 and 4	29

## LIST OF FIGURES

Figure		Page
1	A schematic representation of the basic design of the study (frequency x congruence-incongruence) and the expected pattern of differences among means	1b

## Chapter I

### INTRODUCTION

Sex-role stereotypes can be considered as the generalized expectations people have about the traits and behaviors that characterize males and females (Koblinsky, Cruse & Sugawara, 1978; Williams, Bennett & Best, 1975). From early on, children seem to be aware of the differences in frequencies with which males and females, as groups, endorse certain activities. For example, children as young as 2 1/2 years-old identify the occupations of a doctor or basketball player to be typically filled by males and those of a secretary or dancer to be filled by females (Gettys & Cann, 1981). As children grow older, through the preschool years and beyond, they come to know about more subtle sex-stereotype differences; for example, males as being "tough" and "confident" and females as "softhearted" and "fickle" (Koblinsky, Cruse & Sugawara, 1978; Williams, Bennett & Best, 1975).

In the past, much research has focused on determining how knowledge about sex stereotypes is acquired (e.g., Maccoby, 1960; Mischel, 1970). Within the last few years, though, there has been a growing interest in examining the impact that such knowledge can have on cognitive processes,

particularly memory (Martin & Halverson, 1981, 1983; Signorella & Liben, 1984). The present study follows this new direction. The general aim of this investigation was to study the effect that awareness of sex-role stereotypes can have on children's memory of information related to such stereotypes.

Several researchers have called the knowledge persons have about sex stereotypes "sex-role schemas" (Cann & Newbern, 1984; Martin & Halverson, 1981, 1983; Signorella & Liben, in 1984). According to Martin and Halverson (1981), memory for sex-role related information can be influenced by sex-role schemas in two ways. First, information consistent with schemas (e.g., females ironing and sewing) tends to be remembered while information inconsistent with schemas (e.g., males ironing and sewing) tends to be ignored or forgotten (See Appendix A for a review of the literature). A study by Koblinsky, Cruse and Sugawara (1978) illustrates how this principle of "selective memory" applies to children's recall of sex-role related events. In this experiment, grade 5 children heard stories that described male and female characters performing both stereotypic (e.g., Bill fixes a bike) and reverse stereotypic (e.g., Bill sews a clown suit) activities. Later when asked to recall the content of the stories, these children remembered better masculine activities performed by a male character and feminine activities performed by a female character than

3

feminine activities exhibited by a male character or masculine activities exhibited by a female character.

Results similar to these have been reported by Kropp and Halverson (1983) using preschool children.

Martin and Halverson's (1981) second contention is that sex-role schemas cause sex-role related information to be changed if it is inconsistent with stereotypes and remembered as sex-consistent information (See Appendix A for a review of the literature). Drabman and his colleagues (1978, 1981), Martin and Halverson (1983) and Signorelli and Liben (1984) have reported that when children are presented information about males and females behaving in nonstereotypic ways, they frequently change the sex of the actor in memory to be consistent with stereotypes. Cordara, McGraw and Drabman (1979), for example, showed 5 and 6-year-old children a short movie depicting a male nurse and a female doctor. After the film, these children reported that the nurse had been the female and the doctor had been a male. Reversals such as these were not noted for children who saw a film with a female nurse and a male doctor. These children correctly identified the roles of the male and female actor at recall. Memory distortions such as these are not limited to younger children's data, but have been replicated with older children as well (see Appendix A).

The present study was designed to investigate further the generality of Martin and Halverson's second proposition



that sex-role stereotypes can bias recall or previous experiences. Memory was assessed in the present study by means of a variation of a frequency judgement paradigm. Although there has been little research on the present topic using the frequency judgement paradigm, Sadker and Sadker's (1985, March) brier summary of their observations is relevant. These researchers showed teachers and school administrators a film of a classroom discussion and asked who were talking more in the film. The teachers overwhelmingly said that girls were, although the boys in the film were outtalking the girls at a ratio of three to one. This brief observation illustrates how sex-role stereotypes (girls are more talkative than boys) can lead to the extremely inaccurate perception of sex differences, and consequently such biases by themselves can provide the basis for further stereotyping. In the present study, the frequency judgement paradigm was used to determine the extent to which such information-processing biases can serve to maintain previously developed sex-role stereotypes.

Second and fifth graders were shown a set of slides, each of which contained a male or a female actor engaged in a sex-typed or neutral activity (e.g., reading). There were three types of actor-activity pairs: traditional pairs where male and female actors were paired with sex-stereotypic activities (e.g., a female actor sewing), nontraditional pairs where male and female actors were

paired with counterstereotypic activities (e.g., a male actor sewing), and neutral pairs where male and female actors were paired with neutral activities. Each of these activities (sewing, reading) was presented five times in a random order. This meant that subjects saw a particular activity performed by a male actor  $X$  times and by a female actor  $5 - X$  times ( $X$  ranged from 1 through 4). Sex-role stereotypes are essentially based on frequency judgements taking the form of "Males are likely to do A more frequently..." and "Females are likely to do B more frequently..." rules. Within the present design, conditions existed where frequency assignments to the traditional and nontraditional actor-activity pairs were relatively congruent and incongruent with such stereotypes. In the frequency-congruent condition, the traditional pairs (e.g., a female sewing) were presented more frequently (4 times) than the nontraditional pair (a male actor sewing). In the frequency-incongruent condition, on the other hand, the nontraditional pairs (e.g., a male actor ironing) were presented more frequently (4 times) than the traditional pairs (e.g., a female actor ironing). Children's task was to indicate how many times they had seen an actor engaged in a particular activity.

Assuming that the majority of the present subjects had already learned beliefs concerning differences in the behavior of males and females, it was expected that they

6

would estimate that the traditional actor-activity pairs (a female actor-reminine activity) had been presented more frequently than the nontraditional actor-activity pairs (a male actor-reminine activity). This expectation would be evidenced in two ways. First recall that the traditional pairs occurred more frequently than the nontraditional pairs under the frequency congruent condition while nontraditional pairs occurred more frequently than traditional pairs under the frequency incongruent condition. Thus, it was expected that children would be better at discriminating between high and low frequency inputs under the frequency congruent condition than under the frequency incongruent condition. Second, within each of the frequency conditions (frequency conditions of 1, 2, 3 & 4), it was expected that children would judge that they had seen the traditional pairs more frequently than the nontraditional pairs, although both types of actor-activity pairs had occurred equally frequently.

Finally, neutral activities were also represented by male and female actors in the study. As was indicated, it was expected that subjects would make higher frequency judgements for traditional than nontraditional actor-activity events. Neutral pictures types were included to examine the empirical question of whether or not frequency judgements for the traditional picture types would be higher than those for the neutral pictures types and frequency

judgements of the nontraditional pictures types would be lower than those for the neutral picture types.

## Chapter II

### METHOD

#### Subjects

Sixty-four children participated in this study: 16 males and 16 females from each of grades 2 and 5. The subjects were drawn from a separate school system in Southwestern Ontario. The average age of the grade 2 children was 7 years 6 months, ranging from 7 years 4 months to 8 years 3 months. The average age of the grade 5 children was 10 years 6 months, ranging from 10 years to 12 years. Children were asked to participate only after parental consent had been granted.

#### Materials and Apparatus

The materials in the study included the slide pictures and a questionnaire.

Test Items. These consisted of a set of 75 slides, each of which contained a black and white line drawing of a person engaged in a particular activity. Twelve activities were represented in the main test stimuli (60 slides); these consisted of four that were masculine (boxing, hammering, sawing, farming), four that were feminine (sewing, feeding a baby, washing dishes, ironing) and four that were neutral

(activities that are engaged in equally often by males and females--painting a picture, feeding birds, playing with a dog, reading a book). The classification of each activity was derived from the work of Edelbrock and Sugawara (1978) and Liben and Signorella (1980). These researchers have tested children and adults to determine what activities are considered stereotype-consistent or inconsistent for males and females. The drawings themselves were obtained from various sources (e.g., modified versions of pictures found in the Peabody Picture Vocabulary Test, and the Sex Role Learning Inventory, a test developed by Edelbrock and Sugawara (1978) to determine sex-typed preferences in preschoolers).

Each of these 12 activities was paired with a male actor and a female actor, producing three types of actor-activity pairs: a traditional type where female (male) actors performed feminine (masculine) activities; a nontraditional type where female (male) actors performed masculine (feminine) activities; and a neutral type where female and male actors performed neutral activities. The number of slides depicting a male actor performing a particular activity (e.g., ironing) and a female actor performing the same activity (ironing) varied according to the following frequency combinations: 1 : 4, 2 : 3, 3 : 2, 4 : 1. The first number in the ratio refers to the number of slides showing a male actor engaged in activity A (e.g.,

ironing) and the second refers to the number of slides showing a female actor engaged in the same activity. Three activities (1 masculine, 1 feminine, 1 neutral) were randomly assigned to each of the four frequency combinations. Note that the use of the first two combinations (1 : 4, 2 : 3) with feminine activities was relatively congruent with sex-role stereotypes, that is, female actor-feminine activity (traditional) pairs occurred more frequently (e.g., 4 times) than male actor-feminine activity (nontraditional) pairs (e.g., 1 time). In contrast, the use of the last two conditions (3 : 2, 4 : 1) for feminine activities would be incongruent with sex-role stereotypes. Under these conditions, male actor-feminine activity (nontraditional) pairs occurred more frequently (e.g., 4 times) than female actor-feminine activity (traditional) pairs. For masculine activities, the last two combinations represented congruent conditions while the first two reflected incongruent conditions. The 60 test items (12 activities x 5 slides for each) were arranged randomly with the restriction that the same activity, regardless of the sex of actor in the picture, could not occur consecutively.

In addition to the 60 major test items, 15 additional slides were prepared as "filler" pictures. These pictures represented male and female actors performing three different neutral activities (writing, singing, playing the

piano). Just as the main test items, there were five slides for each of these three activities. Five of these "filler" slides were placed at the beginning of the list and the next five slides at the end, to counteract any primacy or recency effects. The remaining five "filler" pictures were placed in the middle of the list (See Appendix B for Stimuli Pictures).

Two different versions of 75 slides were developed for the present study. The two lists differed only in terms of the frequency combinations assigned to each activity.

Questionnaire Items. These consisted of a list of 21 masculine, feminine and neutral activities; 12 of these were the activities represented in the main test stimuli. The remaining items on the questionnaire were additional masculine (playing baseball, chopping wood), feminine (cooking, washing clothes, shopping for shoes) and neutral (mailing a letter, playing records, delivering mail, drawing) activities, selected from a list provided by Eiten and Signorella (1980).

Apparatus. The slides were presented on a rear-projection screen. The screen (18 x 25.5 cm) was mounted on the front of a 30 x 35 x 75.5 cm box. The rear of the box housed a Kodak Ectographic Carousel slide projector. Stimulus presentations, every five seconds, was controlled by a timer.



### Procedure

Presentation of Stimuli. Each subject was tested individually. A child was seated in front of the rear-projection screen, with the experimenter seated beside him/her. The experimenter began this phase by saying:

I am going to show you some slides. I want you to look at them carefully.

The 75 slides (containing 60 test items and 15 filler pictures) were then presented one at a time, for an interval of five seconds each. Presentation of the two versions of the 75 slides was counterbalanced across sex and age.

Frequency Judgements. Immediately following the presentation of stimuli, the subject was tested on memory for the frequency of occurrence of each picture. A subject was exposed to 24 different pictures (a male/female engaged in each of the 12 activities); these pictures were randomly arranged; however, care was taken that the same activity was not presented consecutively (e.g., a slide of a female sewing, immediately followed by a slide of a male sewing).

The experimenter began this stage by showing the subject one of the filler items and saying:

You see this slide, you saw it (e.g., ~~two~~ times. In a few moments, I will show you some more slides and I would like you to tell me how many times you saw each one. Do you understand?

If a child said "No," or he/she appeared to be confused about the instructions, the experimenter repeated the instructions using another filler item. Each child gave 24

absolute frequency judgements, one for each of the 24 different pictures. These were recorded on a prepared data sheet.

Assessing Knowledge of Sex-role Stereotypes. One week following the frequency judgement stage, the experimenter returned to the classroom and asked children to fill out the questionnaire. The questionnaire contained a list of activities; for each activity, a child's task was to decide, by filling in the appropriate space, who engages in it more often "males," "females," or both engage in an activity equally often. Although each child completed his/her own questionnaire, the experimenter read all instructions aloud to the class as a whole. Children practiced the procedure of filling in the spaces with a few sample activities; the experimenter made certain that each child understood how to do this before allowing the class to begin. The purpose of the questionnaire was to determine whether children's stereotyping of the activities was consistent with what was intended in the study. For instance, "sewing" was intended as a feminine activity. If children believed that "sewing" was a feminine activity, they would have indicated on the questionnaire that this was an activity more likely to be performed by females.

### Chapter III

#### RESULTS

Findings of the present study will be summarized in three sections: (1) results of the questionnaire; (2) results for sex-typed activities when conditions were 1 and 4, and 2 and 3; (3) results for traditional, nontraditional and neutral activities.

##### Questionnaire Results

The children participating in the study were aware of the sex-role stereotypes present in our culture. This was clear from looking at the questionnaire. On the questionnaire, 88.5% of children's responses were sex-typed. That is, when asked to indicate whether the eight sex-typed activities represented in the study were masculine or feminine, children clearly identified the activities performed by men versus women. No differences were observed between sexes or age levels in the number of children who endorsed each activity as masculine or feminine. For example, "sawing" was a masculine activity, and on the questionnaire, 15 males and 16 females at the grade 2 level endorsed this activity as masculine, while all grade 5 children endorsed "sawing" as a masculine activity.

Seventy per cent of children's responses for the items considered engaged in equally often by males and females (reading, playing with a dog, feeding birds and painting a picture) were neutral. No differences were noted between sexes or age levels in the number of children who endorsed each of these activities as neutral.

### Sex-typed Activities

The basic design of the study and the expected pattern of differences among mean frequency estimates will be discussed.

Children's frequency estimates were analyzed when conditions were 1 and 4, and 2 and 3, using a 2 (age) x 2 (sex of subject) x 2 (activity: masculine vs. feminine) x 2 (congruence-incongruence) x 2 (frequency condition: 4 vs. 1/3 vs. 2) analysis of variance. The major concern in these analyses was with the congruence-incongruence x frequency condition interaction which is illustrated in Figure 1. (The ANOVAS were originally computed including the variable "list." However, this was not found to interact with the congruence-incongruence x frequency condition interaction; consequently, data were collapsed across this variable).

As was described in the Method section, the combination of sex of actor and sex-typed activities resulted in: (a) traditional actor-activity pairs (e.g., female actors performing feminine activities) and (b) nontraditional

actor-activity pairs (e.g., male actors performing feminine activities). These traditional and nontraditional pairs were presented under two conditions: (a) a frequency congruent condition in which the traditional pairs occurred more frequently (e.g., a female actor ironing, 4 times) than the nontraditional pair (e.g., a male actor ironing, once) and (b) a frequency incongruent condition in which the nontraditional pairs occurred more frequently (e.g., a male actor sewing, 4 times) than the traditional pairs (e.g., a female actor sewing, once). The basic component of the present study was, therefore, a 2 (actual frequency: 4 vs. 1 or 3 vs. 2) x 2 (congruent-incongruent condition).

The concern with the present data analysis was to determine whether estimates by children for the traditional actor-activity pairs would be greater than those for the nontraditional pairs. This expectation would be evidenced by a significant frequency condition (4 vs. 1 or 3 vs. 2) x congruence-incongruence interaction and can be evaluated in two ways. First, consider cells across rows in Figure 1. It was expected that children would be better at discriminating between high/low frequency inputs under the congruent than incongruent conditions. That is, under the congruent condition, they would assign significantly higher estimates to the traditional pairs that actually occurred more frequently than to the nontraditional pairs that occurred less frequently. Means, therefore, would be higher

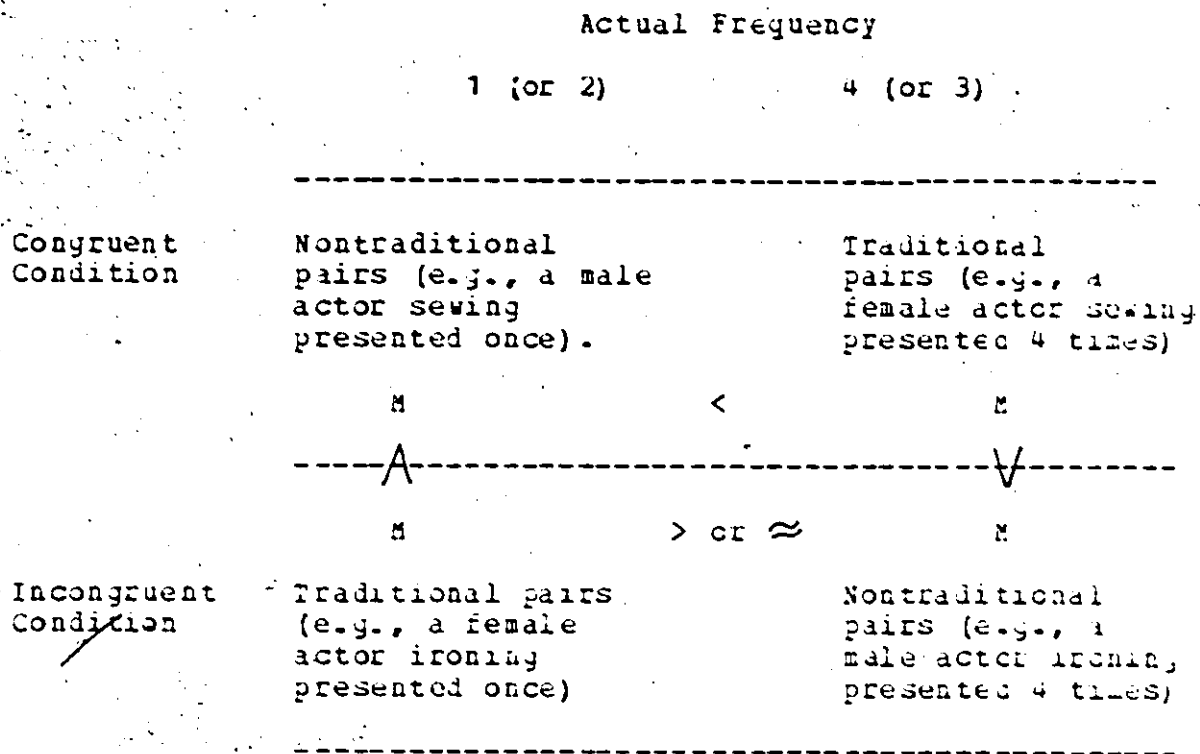


Figure 1. A schematic representation of the basic design of the study (frequency x congruence-incongruence) and the pattern of expected differences among means.

for traditional than nontraditional pictures. Under the incongruent condition, however, the difference in frequency estimates between events that occurred more frequently (in this case, nontraditional pairs) and those that occurred less frequently (in this case, traditional pairs) would be reduced. In the extreme case, the direction of the difference in frequency estimates might be reversed: specifically, those events that appeared less frequently (traditional pairs) might receive higher frequency estimates than those that appeared more frequently (nontraditional pairs). Means, in this instance, would be greater for traditional than nontraditional pairs. Second, consider cells within each of the two columns in Figure 1 (frequency conditions: 1 and 4). The expectation of the present study would be confirmed when frequency estimates for the traditional pairs would be greater than those for the nontraditional pairs within each frequency condition, although both of these actor-activity pairs occurred equally often. The pattern of predicted differences between means across the rows and within each column are indicated in Figure 1. In all cases, follow-up mean comparisons were made using the Tukey (1) test (Cicchetti, 1972). In all analyses, rejection of the null hypothesis required  $p < .05$ , or smaller. For the sake of clearer presentation, only those findings involving the congruence-incongruence  $\times$  frequency condition interactions will be summarized in tables.

Frequency Conditions 1 and 4. The ANOVA in this case revealed a significant frequency condition effect,  $F(1, 60) = 51.18$ ; overall means were greater for condition 4 ( $M = 3.01$ ) than condition 1 ( $M = 2.05$ ). Also found to be significant was the interaction between grade and type of activity,  $F(1, 60) = 4.89$ , because grade 5 children judged that masculine activities ( $M = 2.45$ ) were presented more frequently than feminine activities ( $M = 2.30$ ), while grade 2 children judged that feminine activities ( $M = 2.30$ ) were presented more frequently than masculine activities ( $M = 2.53$ ). Three additional interactions also appeared significant: type of activity (masculine vs. feminine) x congruence-incongruence x frequency condition,  $F(1, 60) = 8.27$ , sex of subject x congruence-incongruence x frequency condition,  $F(1, 60) = 5.32$ , and congruence-incongruence x frequency condition,  $F(1, 60) = 5.91$ .

Mean frequency judgement scores for the congruence-incongruence x frequency condition interaction are summarized in Table 1 for masculine and feminine activities separately. The significant activity x congruence-incongruence x frequency condition interaction emerged because the expected congruence x frequency condition interaction was statistically reliable for the feminine activity,  $F(1, 60) = 13.11$ , but not for the masculine activity. With regard to the feminine activity (see lower half of Table 1), as predicted, children clearly



discriminated those events that appeared more frequently ( $M = 3.19$ ) from those that appeared only once ( $M = 1.95$ ) under the congruent condition. In contrast, children judged that the nontraditional pairs (presented 4 times) occurred only slightly more ( $M = 2.67$ ) than the traditional pairs presented only once ( $M = 2.39$ ), but the difference between means was nonsignificant. The prediction of the study could also be evaluated by examining the pattern of means within each column of the table, as well (lower half). When activities were presented only once (frequency condition 1), children said that they saw a female actor performing a feminine activity ( $M = 2.39$ ) significantly more often than a male actor performing a masculine activity ( $M = 1.95$ ).

For those events that happened four times (frequency condition 4), children reported seeing a female actor in a feminine activity ( $M = 3.19$ ) significantly more often than a male actor in a masculine activity ( $M = 2.67$ ). This pattern of means was expected. With regard to data for the masculine activity, the difference between means for the frequency conditions 4 versus 1 was slightly higher under the congruent condition than the incongruent condition. Under the frequency condition of 4, the expected pattern of significantly higher means for traditional pairs ( $M = 3.20$ ) than nontraditional pairs ( $M = 2.98$ ) was observed.

Mean frequency judgements for the congruence-incongruence x frequency condition interaction are

Table 1

Mean Frequency Judgement Scores For Congruent and  
Incongruent Conditions Under the Frequency Conditions of  
1 and 4: Masculine and Feminine Activities Separately

		Frequency Condition		Difference Between Means
		1	4	
Masculine Activity	Congruent	2.02**	3.20*	1.18
	Incongruent	1.86*	2.98**	1.13
Feminine Activity	Congruent	1.95**	3.19*	1.25
	Incongruent	2.39*	2.67**	.28

\*Taditional actor-activity pair (e.g., a female  
actor-feminine activity)

\*\*Nontraditional actor-activity pair (e.g., a male  
actor-feminine activity).

summarized in Table 2 for boys and girls separately. Analyses of simple effects conducted on the sex of subject x congruence-incongruence x frequency condition interaction revealed that the congruence-incongruence x frequency condition interaction was significant for boys only,  $F(1, 60) = 15.62$  (see upper half of Table 2). As expected, boys clearly differentiated those events that happened once ( $M = 2.05$ ) from those events that happened four times ( $M = 3.38$ ) under the congruent condition, but boys had difficulty discriminating nontraditional events that happened four times ( $M = 2.86$ ) from traditional events that happened once ( $M = 2.47$ ). As predicted, when traditional and nontraditional events were presented once, boys reported seeing more traditional actor-activity pairs ( $M = 2.47$ ) than nontraditional pairs ( $M = 2.05$ ); when events were presented four times, boys said that they saw traditional actor-activity pairs ( $M = 3.38$ ) more often than nontraditional actor-activity pairs ( $M = 2.86$ ). Despite the fact that the congruence-incongruence x frequency condition interaction was not significant for girls, findings were still in the predicted direction. Specifically, the difference between means for frequency conditions 4 and 1 were slightly greater in the case of congruent than incongruent conditions. Also, for both frequency conditions 1 and 4, when traditional and nontraditional events were presented equally often, girls

reported that they saw more traditional actor-activity pairs than nontraditional actor-activity pairs.

Frequency Conditions 2 and 3. The ANOVA for the data revealed two significant interactions: a grade x type of activity interaction,  $F(1, 60) = 4.08$ , and a congruence-incongruence x frequency condition interaction,  $F(1, 60) = 8.29$ . The grade x type of activity interaction can be explained by the fact that grade 5 subjects reported they saw masculine activities ( $M = 2.66$ ) more frequently than feminine activities ( $M = 2.41$ ), while grade 2 children said they saw feminine activities ( $M = 2.84$ ) more frequently than masculine activities ( $M = 2.72$ ).

Mean frequency judgement scores for the congruence-incongruence x frequency condition interaction are summarized in Table 3 for masculine and feminine activities separately. The significant congruence-incongruence x frequency condition indicates that regardless of the type of activity involved (masculine or feminine, see Table 3), children accurately discriminated between the frequency conditions of 3 ( $M = 2.76$ ) and 2 ( $M = 2.40$ ) under the frequency congruent condition. Under the frequency incongruent condition, though, children's judgements for the traditional pairs that occurred twice ( $M = 2.80$ ) were higher than judgements for the nontraditional pairs that occurred three times ( $M = 2.66$ ). However, this difference was not statistically reliable. When pictures were

Table 2

Mean Frequency Judgement Scores for Congruent and  
Incongruent Conditions Under the Frequency Conditions of  
1 and 4: Boys and Girls Separately

		Frequency Condition		Difference Between Means
		1	4	
Boys	Congruent	2.05**	3.38*	1.33
	Incongruent	2.47*	2.86**	.39
Girls	Congruent	1.92**	3.02*	1.10
	Incongruent	1.76*	2.80**	1.02

\*Traditional actor-activity pairs (e.g., a female  
actor-feminine activity)

\*\*Nontraditional actor-activity pairs (e.g., a female  
actor-masculine activity)

presented two times, judgements were significantly higher for portrayals that were traditional (males in masculine activities, females in feminine activities,  $\bar{M} = 2.80$ ) than nontraditional (males in feminine activities, females in masculine activities,  $\bar{M} = 2.40$ ). While the same pattern appeared for pictures that were presented 3 times, the means were not significantly different ( $\bar{M} = 2.76$  and  $\bar{M} = 2.66$  for traditional and nontraditional pairs, respectively).

The sex of subject  $\times$  congruence-incongruence  $\times$  frequency condition interaction closely approached significance,  $F(1, 60) = 2.92, p < .09$ . As a result, the pattern of findings for the congruence-incongruence  $\times$  frequency condition interaction was examined for boys and girls separately. Appropriate mean frequency estimates for this triple interaction are summarized in Table 4. As expected, both boys and girls discriminated events that occurred 2 times from events that occurred 3 times under the frequency congruent condition. Specifically, for both sexes, under the congruent condition judgements for condition 3 were greater than judgements for condition 2. However, boys had more difficulty than girls discriminating events under the incongruent condition. Specifically, when the condition was incongruent, girls reported seeing more nontraditional pairs that occurred three times ( $\bar{M} = 2.66$ ) than traditional pairs that occurred twice ( $\bar{M} = 2.58$ ), boys reported seeing more traditional pairs that occurred

Table 3

Mean Frequency Judgement Scores for Congruent and  
Incongruent Conditions Under Frequency Conditions of  
2 and 3: Masculine and Feminine Activities Separately

		Frequency Condition		Difference Between Means
		2	3	
Masculine Activity	Congruent	2.27**	2.81*	.54
	Incongruent	2.91*	2.75**	-.10
Feminine Activity	Congruent	2.53**	2.70*	.17
	Incongruent	2.69*	2.56**	-.13

\*Traditional actor-activity pairs (e.g., a female  
actor-feminine activity)

\*\*Nontraditional actor-activity pairs (e.g., a female  
actor-masculine activity)

twice (  $\bar{M} = 3.02$  ) than nontraditional pairs that occurred three times (  $\bar{M} = 2.66$  ). When nontraditional and traditional pairs were presented equally often, for both frequency conditions 2 and 3, boys and girls indicated they saw traditional actor-activity pairs more often than nontraditional actor-activity pairs.



Table 4

Mean Frequency Judgement Scores for Congruent and  
Incongruent Conditions Under Frequency Conditions of  
2 and 3: Boys and Girls Separately.

		Frequency Condition		Difference Between Means
		2	3	
Boys	Congruent	2.53**	2.97*	.44
	Incongruent	3.02*	2.66**	-.36
Girls	Congruent	2.27**	2.55*	.29
	Incongruent	2.58*	2.66**	.08

\*Traditional actor-activity pairs (e.g., female  
actor-feminine activity)

\*\*Nontraditional actor-activity pairs (e.g., a male  
actor-feminine activity)

### Traditional, Nontraditional and Neutral Events

Frequency judgements for neutral actor-activity pairs were compared with frequency judgements for traditional and nontraditional actor-activity pairs for each of the frequency conditions (1, 2, 3 and 4). These findings are summarized in Table 5. For each of the frequency conditions (1, 2, 3 and 4), the same general trend was observed: judgements for traditional and neutral actor-activity pairs were comparable and frequency judgements for neutral actor-activity pairs were always higher than judgements for the nontraditional actor-activity pairs. However, significant differences among judgements for the three types of pairs emerged only in condition 2,  $F(2, 126) = 3.09$ , and 4,  $F(2, 126) = 7.47$ . In condition 2, frequency judgements for traditional actor-activity pairs ( $M = 2.66$ ) were not significantly lower than judgements for neutral actor-activity pairs ( $M = 2.80$ ); however, judgements for neutral actor-activity pairs ( $M = 2.66$ ) were significantly higher than judgements for nontraditional pairs ( $M = 2.40$ ). With condition 4, frequency judgements for neutral actor-activity pairs ( $M = 3.31$ ) were not significantly higher than means for traditional actor-activity pairs ( $M = 3.20$ ). Judgements for neutral activity pairs ( $M = 3.20$ ) were significantly higher than those for nontraditional pairs ( $M = 2.34$ ).

Table 5

Mean Frequency Judgement Scores for Traditional,  
Nontraditional and Neutral Actor-Activity Pairs  
Under Frequency Conditions 1, 2, 3 and 4

Actor-Activity Pairs			
Condition	Traditional	Nontraditional	Neutral
1	2.16	1.98	2.10
2	2.80	2.40	2.06
3	2.76	2.06	2.65
4	3.20	2.64	3.31

The possibility was also investigated that frequency judgements for the neutral activities may have been different for children who agreed that the four activities represented in the pictures were neutral compared to subjects who agreed that some, not all, or the intended neutral activities were neutral (data presented in Table 5). Twenty-five children were identified who classified all four neutral activities on the questionnaire as neutral. Mean frequency judgement scores were computed for these subjects for traditional, nontraditional and neutral pairs. The pattern of results that emerged was the same as that previously described: frequency judgements for traditional and neutral actor-activity pairs were comparable, and judgements were higher for neutral than nontraditional actor-activity pairs. Means for traditional, nontraditional and neutral actor-activity pairs were:  $\bar{M} = 2.16$ ,  $\bar{M} = 1.98$ ,  $\bar{M} = 2.10$ , respectively, for Condition 1;  $\bar{M} = 3.00$ ,  $\bar{M} = 2.30$ ,  $\bar{M} = 2.84$ , respectively, for Condition 2;  $\bar{M} = 2.94$ ,  $\bar{M} = 2.30$ ,  $\bar{M} = 3.00$ , respectively, for condition 3, and  $\bar{M} = 3.42$ ,  $\bar{M} = 3.18$ ,  $\bar{M} = 3.20$ , respectively, for Condition 4.

## Chapter IV

### DISCUSSION

The present study was conducted to demonstrate that children's sex-role stereotypes can have a biasing effect on their processing of sex-role related information. The general hypothesis of the study was that children would estimate that events consistent with sex-role stereotypes (e.g., a woman feeding a baby) had occurred more frequently than events inconsistent with stereotypes (e.g., a male feeding a baby). In the present section, this hypothesis will be evaluated in terms of the obtained data and the implication of the data will be discussed. Then, secondary findings of the study, for example, sex and age-related differences in the biasing effects of stereotypes on information processing will be considered. Finally, three possible hypotheses for explaining the obtained findings will be discussed.

With few exceptions, the general hypothesis of the study was confirmed. As was indicated previously (see Results, p. 15), the biasing effects of stereotypes on frequency judgements would be evidenced by a significant congruence-incongruence x frequency condition interaction. This interaction emerged highly significant in both the 1 :

4 and 2 : 3 frequency conditions. Children's judgements were relatively accurate when actor-activity pairs consistent with stereotypes were presented more frequently than those pairs inconsistent with stereotypes (e.g., 4 slides portraying a female actor sewing vs. 1 slide of a male actor sewing). However, when stereotype-inconsistent pairs occurred more frequently than the stereotype-consistent pair, children tended to report that the nontraditional (male actor ironing) and traditional pair (female actor ironing) appeared about equally often. When nontraditional pairs actually occurred three times and the traditional pairs occurred two times, children estimated that the traditional pairs had been presented more often than the nontraditional pairs. Under the frequency conditions of 2 and 4, children judged that stereotype-consistent pictures had occurred significantly more frequently than stereotype-inconsistent pictures, although both of these types were presented equally often. The same nonsignificant trend was observed under the frequency conditions of 1 and 3. In all then, these findings support the general hypothesis of the study. The major conclusion of the present research is that sex-role stereotypes can bias children's processing of sex-role related information.

The findings of the present study may provide insight into understanding why stereotypes are very resistant to change once they are acquired. A number of investigators

have examined sex stereotypes that children and adults have. One impressive aspect of their findings is that the kinds of activities and attributes assigned to males and females have not been changed for the past 30 years (see Sharier, 1979, for a review). In contrast, the roles of men and women have become more diffused within the last 20 years. It is becoming increasingly less unusual to hear of women entering male dominated fields such as accounting and engineering and men participating in traditionally feminine behaviors such as taking care of children. Furthermore, Maccoby and Jacklin (1979) have demonstrated that many of the popularly accepted beliefs about sex differences are generally not true. Even when differences exist, they are minimal. Thus, there are as many submissive, nurturant, neat and quiet boys as girls. In other words, people's beliefs about differences between the sexes are remarkably persistent.

Why do sex-role stereotypes continue to persist even though they bear little relation to the real sex differences? Perhaps, people maintain stereotypes because factual data that disconfirm their beliefs are not available. In the event that the individual is exposed to such data, will the data serve to disconfirm the belief? The results from the present study indicate that such data are unlikely to serve to disconfirm stereotypes. Consider for example, the findings from the frequency condition of 4. Children were presented stereotype-consistent and

inconsistent events equally often (4 times). Due to the biasing effects of stereotypes, though, children reported that the stereotype-consistent events had occurred more frequently than the inconsistent events. This demonstrates that the biasing effects on frequency estimates can serve to confirm and maintain original beliefs.

Another conclusion drawn from the present findings is that boys are more likely than girls to show the biasing effects of stereotypes on memory. The data analysis from the frequency conditions of 1 versus 4 and 2 versus 3 indicated that the expected congruence-incongruence x frequency condition interaction was observed more clearly with the boys' than the girls' data. According to previous research, males tend to be more rigid than females in their attitudes towards sex-typing. Langlois and Downs (1980), for example, were interested in mothers' and fathers' reactions to the sex-typed play of their children. They found that fathers were particularly pleased when their children played with sex-typed toys and became especially punitive when their children engaged in cross-sex play (e.g., boys playing with dolls and girls playing with cars). Mothers were not as strict in their dispensing of rewards and punishments. In other words, males endorsed stereotypes more rigidly than females. Moreover, results from preference tests with children also suggest that males are generally more rigidly sex-typed than females. When boys



and girls are asked to select what activities they would prefer to participate in (e.g., giving a tea party, boxing, owning a train set, driving a motorcycle), boys more than girls tend to make selections that are consistent with sex-role schemas (Nadlerman, 1970, 1974; Edelbrock & Sugawara, 1978). The present findings that the biasing effect was generally stronger for boys represent additional support for the usual argument that males are more rigidly sex-typed than females.

Two age levels were included in the present study to determine whether age-related differences would exist in the biasing effect. Analysis of children's frequency judgements did not reveal any significant age x congruence-incongruence x frequency condition interactions, implying that the biasing effect of sex schemas is similar for second and fifth graders. Differences between the age levels was originally anticipated: That is, it was presumed that with age, children's sex-role schemas would become more flexible and, consequently, the biasing effect would be lessened for older subjects. Results from the questionnaire revealed that older subjects were not more likely than younger subjects to classify the sex-typed activities as neutral (one way to define "flexibility"). Since older and younger children's sex-role schemas were highly comparable, this can explain why the biasing effects of sex schemas on memory was not stronger for the older than younger age group.

The finding of no age differences was also reported by Signorella and Liben (1984) when they tested differential remembering of traditional and nontraditional pictures with kindergarten, second and fourth graders. However, Drabman et al. (1981) and Mapley and Kizer (1983) reported developmental differences do emerge. These researchers found that at least for immediate recall, older children make fewer errors in recalling stereotype-inconsistent material than younger children. Older children in these studies were in the sixth and seventh grades. Findings involving age-related differences in these studies and the previous research are not directly comparable though, since quite different procedures were used in assessing the biasing effect.

Thus far, the discussion has been concerned with differences in children's frequency estimates for stereotype-consistent and stereotype-inconsistent events. If sex-role stereotyping involves the association of certain activities with one sex, then the portrayals of "a boy performing an neutral activity" and "a girl performing a neutral activity" can neither be classified as stereotype consistent or inconsistent. Rather, these portrayals represent events unrelated to stereotypes. An empirical question was whether children's frequency judgements for stereotype-unrelated information would be like frequency judgements for stereotypical or counterstereotypical events.

Generally the tendency was for children to assign higher estimates to the neutral than inconsistent events, but similar estimates to the neutral and consistent events. The generality of this finding is difficult to evaluate at this point. Previous research has not focused on determining how children's memory for neutral events compared with memory for traditional and nontraditional information. Investigating this issue may be an interesting possibility for future studies in this area.

The present study was not designed to determine why children assign higher frequency estimates to stereotype-consistent than stereotype-inconsistent items. However, a few of the possible mechanisms that might be operating to produce such results will be speculated here.

The first hypothesis is that children merely use a guessing strategy. When asked to give frequency estimates of the number of times each of the traditional and nontraditional events had occurred, children used the rules of "Males do X more frequently..." and "Females do Y more frequently..." and, accordingly, assigned higher estimates to pictures of traditional actor-activity pairs than to nontraditional actor-activity pairs. The use of this strategy would produce uniformly high frequency judgement scores for the traditional pairs across different frequency conditions and low frequency judgements for the nontraditional pairs. Contrary to this expectation,

children tended to provide differentiated frequency judgements for different frequency conditions. Consider children's responses under the frequency conditions of 1 versus 4 when conditions were incongruent; children assigned higher estimates for nontraditional pairs that occurred 4 times than ( $M = 2.93$ ) traditional pairs that occurred 1 time ( $M = 1.98$ ). Consequently, the first hypothesis does not explain the findings well.

A second possibility is that knowledge of sex-role stereotypes may differentially affect the encoding of stereotypical and counterstereotypical information. For instance, Martin and Halverson (1983) suggest a possibility that when children are presented with a counterstereotypical event, for example, "a boy cooking," they may encode this event as a stereotypical one, for example, "a girl cooking," or "a boy fixing a stove." Since the nontraditional items may be transformed into traditional items during encoding, children may report that the nontraditional items occurred much less frequently than traditional items. While the present subjects might have encoded nontraditional items incorrectly, as is illustrated here, the results could not have been solely due to this encoding factor. Martin and Halverson (1983) have observed that distortions of the nontraditional items occur at both encoding and retrieval. They pointed out, however, that such distortions are more likely to appear during the retrieval process.

A third possible mechanism is the use of what Tversky and Kahneman called the "availability" heuristic (see Nisbett & Ross, 1980), in which frequency judgements are viewed as being influenced by the "availability" of events. The general idea behind this view is that when a person can vividly recall, reconstruct and recognize a particular event (i.e., availability), that person generally judges that the event must have occurred frequently. If the event is not quite vividly remembered, a person judges that the event likely occurred less frequently. The availability of information about an event in memory is often associated with an objective frequency with which such an event has occurred. For example, an event that occurred 100 times will be remembered more vividly than an event that happened 10 times, and is, therefore, assigned a high frequency.

The availability of information in memory can be affected by factors other than actual frequency. Therefore, the availability heuristic can be misleading. In the case of the present study in which frequency judgements of co-occurrence were examined (e.g., if a male actor, then activity X; if a female actor, then activity Y), the strength of the associative bond between two events represents such an additional factor affecting the availability of information. Actors and activities are presumably strongly associated for traditional pairs (e.g., a male actor-sawing) while actors and activities are

presumably weakly associated for nontraditional pairs. As a result, information about traditional pairs would be relatively more available than that for nontraditional pairs and, consequently, should receive higher frequency estimates when these events are presented equally often. In general, the present findings for the sex-typed activities (see results, pp. 14-27) are quite consistent with this "availability" heuristic hypothesis.

The availability heuristic, though, does not adequately explain results of the neutral activities. In this study, the neutral actor-activity pairs were judged to occur about as often as the traditional actor-activity pairs when both types were presented the same number of times. This happened despite the fact that the associative strength for traditional actor-activity information is presumably stronger than the associative strength for neutral actor-activity information. This finding is inconsistent with what the availability heuristic model would suggest. However, the present study was not designed to evaluate what mechanisms are responsible for producing the biasing effect, therefore, the mechanisms offered for explaining the results are speculative.

Summary. The present research was conducted to demonstrate that children's sex-role stereotypes can have a biasing effect on their processing of sex-role related information. The basic hypothesis of the study, that

children would estimate that events consistent with sex-role stereotypes had occurred more frequently than events inconsistent with stereotypes, was confirmed. The findings of the present study appear to have significant implications for understanding why stereotypes are resistant to change once they are acquired. Results suggested that stereotypes are difficult to disconfirm because even when children are presented with evidence that does not support stereotypes, they tend to distort such information in memory and recall it as consistent with stereotypes. As a result, the original stereotypical belief is strengthened rather than changed.

## Appendix A

### REVIEW OF LITERATURE

Recently, Martin and Halverson (1981) developed a model to explain how knowledge about sex stereotypes affects behavior. The basic premise of the model is that children have knowledge about sex stereotypes (sex schemas) and that such knowledge influences how children act and what they remember. The interest of the present paper is to focus on the aspects of this model which concern how knowledge about sex stereotypes affects memory for sex-role related information. In this paper, Martin and Halverson's (1981) predictions about how sex-role schemas can affect memory will be presented. The influences of age and sex-role orientation will be considered in terms of how they interact with schemas to affect memory. Finally, the role that methodology can play in examining these issues will be discussed.

#### Martin and Halverson's Model

Martin and Halverson (1981) call the knowledge children have about sex stereotypes "sex schemas." These researchers propose that children have two sex schemas. One is an overall, "in-group-out-group" schema. It contains the



44  
information children need to categorize objects, behaviors, traits and roles as being either for males or for females. For instance, a boy can rely on this schema to obtain information that "boys can play with trucks," while "girls play with dolls."

The second schema is the "own-sex" schema. It is a narrower and more specific version of the first because it contains information about the objects, behaviors, traits and roles that characterize a child's own sex. The own-sex schema contains detailed scripts and plans of action required to carry out sex-appropriate behaviors. For example, a girl may know from her overall schema that girls sew. Her own-sex schema will contain the action patterns involved in sewing.

According to Martin and Halverson's model (1981), sex-stereotype schemas influence memory by: (1) causing sex-role related information to be remembered if it is consistent with stereotypes and (e.g., males hammering, females cooking) and (2) causing sex-role related information to be changed and made to fit existing schemas, if it was inconsistent with stereotypes (e.g., recalling a female taking care of a baby, when actually a male was viewed in this activity). Each proposition will be considered separately.

### The First Proposition

Developmental Trends. The interest here is whether the influences sex stereotype schemas have on memory for sex-role related information changes as children develop. Martin and Halverson (1981) maintain that young children, because their thinking is relatively concrete, have rather inflexible views of "what males and females do." In light of this, and the limitations on children's memory, it is not surprising that information that does not fit stereotypical views should be ignored or forgotten in memory. As children reach a more mature level of cognitive development, though, it is possible for them to redefine group membership and develop more flexible notions of "what males and females do." This implies that as children grow older they should show better memory for counterstereotypical information because counterstereotypical information has become incorporated into schemas.

Studies with young children generally show they have poorer memory for sex-inconsistent than sex-consistent information. For example, Kropp and Halverson (1980) had preschoolers listen to four stories where a boy or girl engaged in either a sex-consistent or sex-inconsistent activity (e.g., Debbie playing with her dolls, Jane gets a train set, Peter is given a train set, William gets a doll). The results indicated that recall was better for stories where an actor engaged in an activity typically associated with its sex.

Jennings (1975) did not find the same results with preschoolers, but her study had several methodological problems which limited the interpretation of findings. Jennings had preschoolers recall two stories: one where a same-sex character as the child acted in a sex-consistent way (e.g., girl wanting to be a ballerina/boy wanting to be a mail carrier) and one where a same-sex character as the child acted in a sex-inconsistent way (e.g., girl wanting to be a mail carrier/boy wanting to be a dancer). The results indicated better memory for the sex-inconsistent story, presumably, Jennings argued, due to its novelty. But, as Koblinsky, Cruse and Sugawara (1978) point out, this researcher only presented subjects with stories where a same-sex character as the child served as actors; they were not exposed to instances with an opposite-sex character in stereotypic and reverse-stereotypic roles. In addition, it was not known how much preschoolers perceived the behaviors or characters as sex-consistent or inconsistent because the occupations are typically associated with adults, not children.

Koblinsky, Cruse and Sugawara (1978) controlled for the issues that limited Jennings' (1975) findings, in their study with grade five children. First, these researchers determined what behaviors and traits fifth graders considered consistent or inconsistent with males and females. Using these, they developed stories featuring a

41

boy and girl character where each character exhibited masculine and feminine behaviors (e.g., Bill fixing a bike, sewing a clown costume) and traits (e.g., Bill being messy and afraid). Children's memory was assessed using a recognition task; subjects were asked to supply the name of the actor who had performed each of the behaviors and traits. The researchers reported that both boys and girls remembered better the stereotypic than reverse stereotypic behaviors and traits of characters.

The studies of Kropp and Halverson (1980) and Koblinsky, Cruse and Sugawara (1975) demonstrate that like preschoolers, fifth graders remember better stereotypical than counterstereotypical story content. This may suggest that grade five children, as their younger counterparts, have relatively inflexible sex-role schemas; as a result, information consistent with such schemas is remembered while information inconsistent with such schemas is ignored or forgotten. Studies with older children are needed, though, to investigate whether this performance changes in older subjects; that is, do children develop more flexible sex schemas with age and this results in improved memory for counterstereotypical material?

Sex-Role Orientation. Sex-role orientation (preference for, adherence to stereotypes) would appear to be an important factor to consider in evaluating children's differential memory for stereotypical versus

counterstereotypical information. At each age level, children may exist that have stronger attitudes or preferences towards stereotyping than others. That such a variable should influence memory was first implied by Bartlett (1967) who suggested that each person's "temperament" or "character" serves to organize memory. Bartlett proposed that individuals should remember better information that is consistent with their attitudes, beliefs and ideas than information that is not consistent. Researchers since Bartlett have developed his ideas and examined whether persons who have highly stereotyped gender attitudes remember better stereotypical than counterstereotypical information (because the former is more consistent with attitudes) and whether individuals who do not rigidly adhere to stereotypes have any differential memory for stereotypical versus counterstereotypical information.

Signorella and Liben (1984) tested such an issue. To assess gender attitudes, these researchers presented kindergarten, second and fourth graders with a series of activities and asked them to decide whether they could be done by "men," "women," or "both." A high percentage of "both" responses indicated a low adherence to stereotypes. This group was considered to have "low gender attitudes" versus "high gender attitudes" (low percentage of "both" responses). The children were shown 60 pictures to

remember: 20 traditional (e.g., female secretary), 20 nontraditional (e.g., male telephone operator) and 20 neutral (e.g., man reading a newspaper). Findings revealed that at all age levels, the highly stereotyped children recalled more traditional than nontraditional pictures. While it was expected that low stereotyped children would recall an equal number of traditional and nontraditional pictures, they actually recalled more nontraditional pictures.

Kostoulas (1984), on the other hand, did not find a strong relationship between memory for stereotypical versus counterstereotypical material and sex-role orientation. However, Kostoulas assessed memory using different methods than Signorella and Liben (1984). This researcher showed 7 to 9-year-olds videotapes of a child actor in a group of opposite-sex children making stereotypical (e.g., female saying she would bake a cake after dance lessons) or counterstereotypical remarks (e.g., male making the same statement). She found no overall differences in memory for such content (using four different measures) between children classified as androgenous, stereotyped, reversed stereotyped or undifferentiated (based on scores from a personality attributes questionnaire). However, Kostoulas did find that when the difficulty of the task was increased (by giving the same speaking role to a child in a group of children of the same sex), some differences were noted

between sex-role orientation and memory, but only on more sensitive memory measures. Taken together, the studies of Signorella and Liben (1984) and Kostoulas (1984) demonstrate that when studying the relationship between sex-role orientation and memory, methodology, specifically the manner in which memory and gender attitudes is assessed, as well as difficulty of the task, must be considered carefully because it can influence results dramatically.

### The Second Proposition

Developmental Trends. Martin and Halverson's (1981) suggestion that sex schemas become more flexible with age has implications for their second contention as well. If young children have relatively inflexible views of "what males and females do," it would not be surprising to find that information inconsistent with such stereotypes (e.g., girl sawing) is distorted in memory and recalled as being consistent with stereotypes (e.g., boy sawing). However, if sex schemas become more flexible with age, and counterstereotypical information becomes a part of such schemas, fewer distortions would be expected in older children's memory for counterstereotypical content.

Coriura, McGraw and Drabman (1979) demonstrated that 5 to 6-year-olds distort counterstereotypical information in memory. In their study, children viewed short films where a male and female actors portrayed the roles of a physician

and nurse. Results revealed that when confronted with counterstereotypical portrayals, for example, a male nurse, a female physician, children were likely to relabel them into the typical instances of a male physician and a female nurse.

This finding was replicated by Drabman, Patterson, Jarvie, Hammer and Cordura (1981). However, this experiment included younger and older children as well. Preschool, first, fourth and seventh graders were shown only one videotape depicting a female physician and a male nurse and children were asked to identify photographs or names of the actors. Findings revealed that only the seventh graders made correct identification of the female physician and male nurse at recall; younger children tended to give male names or pictures for the physician and female names or pictures for the nurse. This study supports the developmental trend of fewer distortions with age as predicted by Martin and Halverson (1981).

Mapley and Kizer (1983) were also interested in whether distortions in memory for counterstereotypical material decreases with age. In this study, kindergarten, second and fourth graders viewed slide presentations with a taped dialog depicting four different role pairs: doctor-nurse, boss-secretary, principal-teacher, breadwinner-homemaker. For each role pair, one episode was developed with a male filling the first role and a female the second (sex



congruent) and one episode with a female filling the first role and a male the second (sex incongruent). Each episode consisted of about 25 slides where characters acted in occupationally specific behaviors (e.g., boss asking for coffee, secretary making it). Memory was assessed using free and probed recall measures, immediately after each episode. An important finding was that the four sex-role incongruent episodes varied significantly in their power to evoke memory errors. For example, for both free and probed recall, there was substantial distortion for the doctor-nurse, boss-secretary sex-role incongruent episodes (e.g., labelling the females as the nurse and secretary and the males as the doctor and boss), with distortions decreasing developmentally with age. But, the same clear results did not appear for the principal-teacher, breadwinner-homemaker episodes.

Mapley and Kizer's (1983) findings demonstrate the important role that methodology can have in influencing results. In the case of Mapley and Kizer's study,<sup>3</sup> the stimuli selected profoundly affected the findings. The effects of other variables related to methodology, such as the time at which memory is assessed and the manner in which memory is assessed should also be considered. Kizer and Mapley (1983) were interested in whether delay in assessing memory can influence results. These researchers replicated their previous study (Mapley & Kizer, 1983) except that

memory for episodes was assessed about 10 minutes after presentation. Findings revealed that there was lower recall for the schema inconsistent information when memory was delayed, compared to when assessment was immediate (in the first study). However, while this effect was significant for the probed recall condition, it was marginally, but not meaningfully significant for the free recall condition, and as before, the four sex-role incongruent episodes varied significantly in their power to evoke memory errors.

Drabman and his colleagues (1981) were also interested in whether the interval between presentation of stimuli and assessment can affect results. As part of their study of developmental trends in children's distortion of information, these researchers returned to the seventh graders one week following testing. At this time children were asked to redo the recall task. Findings revealed that after one week, the children could no longer choose significantly the correct gender for the occupations.

Kizer and Mapley (1981) appropriately summed up these findings when they argued that "children's processing of sex-role incongruent information is a complex process which can only be understood in terms of several factors--the children's age, the episodic theme portrayed, the type of memory assessed, and the interval between presentation and assessment," and to this we might add the sex-role orientation the child possesses.

Sex-role Orientation. The premise behind studies investigating the relationship between gender attitudes and distortion is that persons who have highly stereotyped gender attitudes should show more instances of distortion than individuals who do not rigidly adhere to stereotypes (Signorella & Liben, 1984). The relationship between sex-role attitude and distortion was assessed by Signorella and Liben in the experiment previously mentioned. Memory for pictures was considered distorted if a child recalled the wrong sex of the character, thus changing a nontraditional to traditional picture, or visa versa (e.g., reporting to have seen a girl sewing, rather than a boy), or if a child incorrectly interpreted an activity, transforming a nontraditional picture to a traditional one, or visa versa (e.g., recalling a boy fixing a stove, rather than cooking). Signorella and Liben reported that the most frequently occurring distortions were those that changed a nontraditional item to a traditional one, but at each grade level (kindergarten, two and four), the children classified as highly stereotyped produced more of these distortions than children considered low in gender attitudes.

As part of the same study, Signorella and Liben (1984) demonstrated that task difficulty can interact with these results. In a separate experiment, grade one children classified as having high versus low gender attitudes were given an easier recall task: 15 pictures rather than 60,

evenly divided between traditional, nontraditional and neutral items. As before, nontraditional to traditional reconstructions were the most frequently occurring, but no differences were observed between high and low attitude children in the number of memory errors they made.

Signorella and Liben (1984) argued that their study showed that as the memory task increases in difficulty, memory becomes more schemas consistent. But, Martin and Halverson (1983) found no relationship between sex-role orientation and distortion of sex-related information using a quite difficult memory task. These researchers classified 5 to 6-year-olds as having high versus low gender attitudes (based on various scores from the Sex Role Learning Inventory, Edelbrock & Sugawara, 1978). The children were shown 72 pictures of males and females engaged in masculine, feminine and neutral activities. Free and probed recall for these pictures, one week later, revealed no differences between children classified as high or low stereotyped in the number of memory errors produced (errors were defined in the same ways as Signorella and Liben, 1984).

### Summary

Most of the literature reviewed supports Martin and Halverson's (1981) contentions that sex schemas can affect memory for sex-role related information. Martin and Halverson's first proposition is that sex schemas cause

information that is consistent with sex-role stereotypes to be remembered better than information that is inconsistent with stereotypes. Studies with young children (e.g., preschoolers, first and fifth graders) seem to support these propositions (Cordura, McGraw & Drabman, 1979; Kropp & Halverson, 1983; Koblinsky, Cruse & Sugawara, 1978).

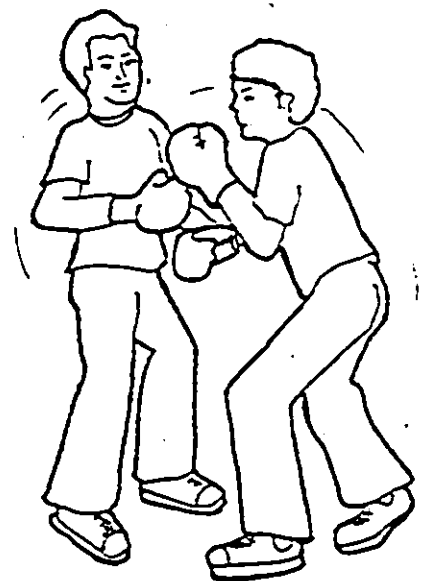
Studies which have examined developmental differences in memory for counterstereotypical material (Drabman et al., 1981; Kizer & Mapley, 1983; Mapley & Kizer, 1983) generally report that as children grow older, memory for counterstereotypical information improves and fewer distortions of counterstereotypical material occur at recall. Martin and Halverson (1983) suggest that older children may develop more flexible sex schemas than younger children (e.g., schemas that incorporate sex-inconsistent material). For this reason, when presented with counterstereotypical material, older children are not as likely as younger children to disregard or ignore such information (leading to forgetting) because it does not fit with what they know to be "true" about what males and females do. Mapley and Kizer (1983) impress the importance, though, of being aware that the sex-related materials selected and the delay imposed before memory is assessed can affect results dramatically.

This same caution is applied to studies which have examined whether an individual child's preference for, or

adherence to, sex-role stereotypes affects memory for sex-related information. The presumption behind such studies is that degrees exist between children in how strongly they adhere to stereotypes; for example, even though young children are considered to rigidly adhere to stereotypes, within this group there may be children who adhere more rigidly than others. Results of studies examining the relationship between sex-role orientation and distortion of sex-related information appear to vary. Some studies report a relationship (e.g., Kostoulas, 1984; Signorella & Liben, 1984), others do not (e.g., Kostoulas, 1984; Martin and Halverson, 1983). However, these studies are not directly comparable since each uses a different method for assessing sex-role orientation and various different measures assessing memory. Obviously, future studies in this particular area will need to identify methods of assessment that yield more consistent results. With these methods, it may be interesting to explore whether sex-role orientation is subject to developmental changes and how such changes may affect memory for sex-related information. Knowing this can lead to expansion of Martin and Halverson's (1983) present memory model.

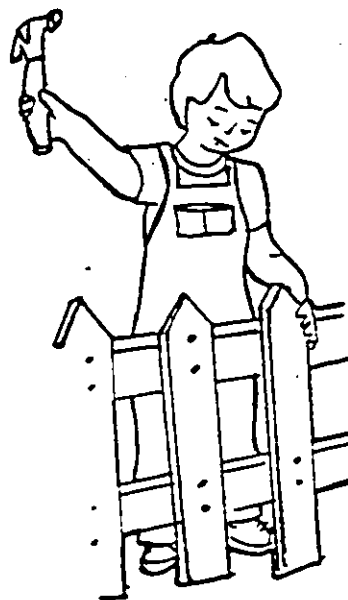
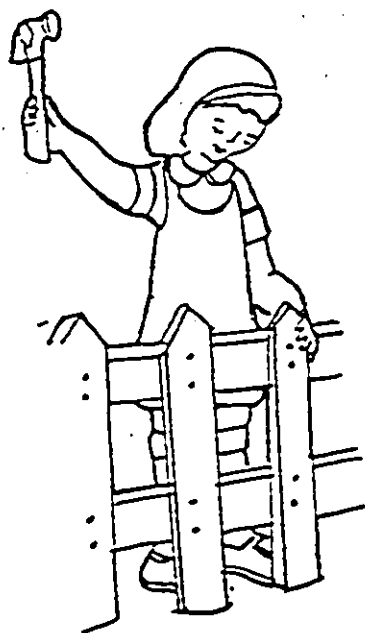
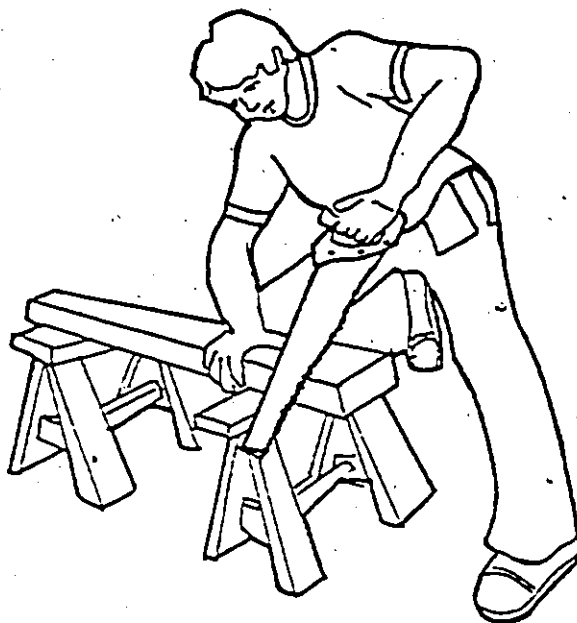
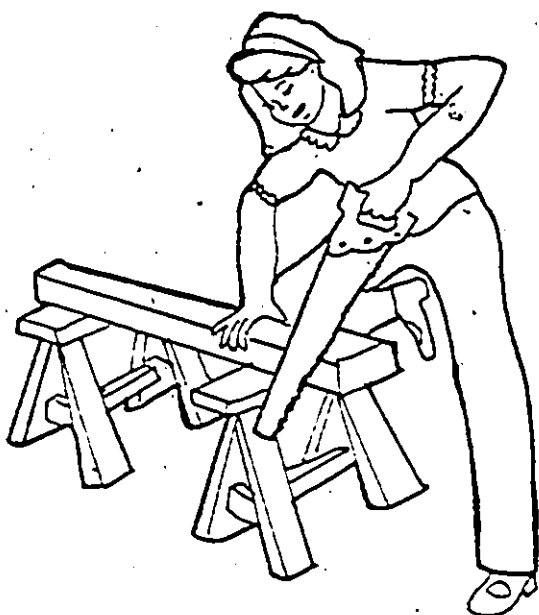
Appendix B  
STIMULI PICTURES

Masculine Activities

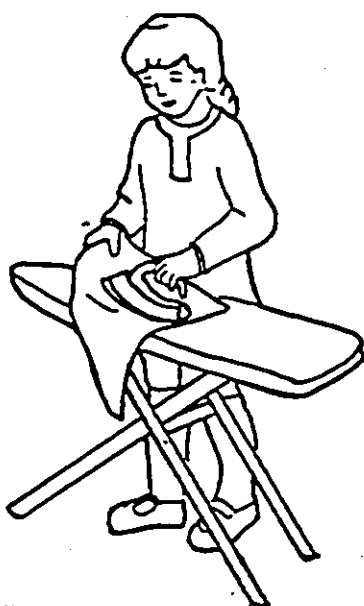




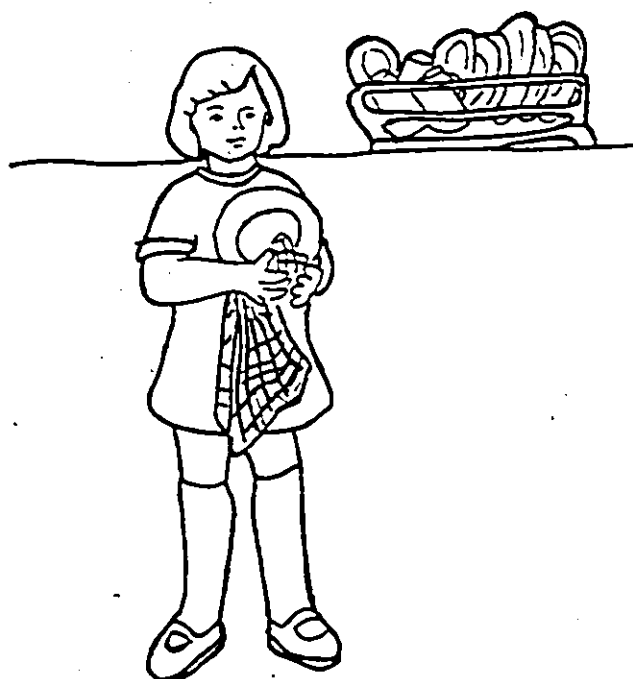
## Masculine Activities



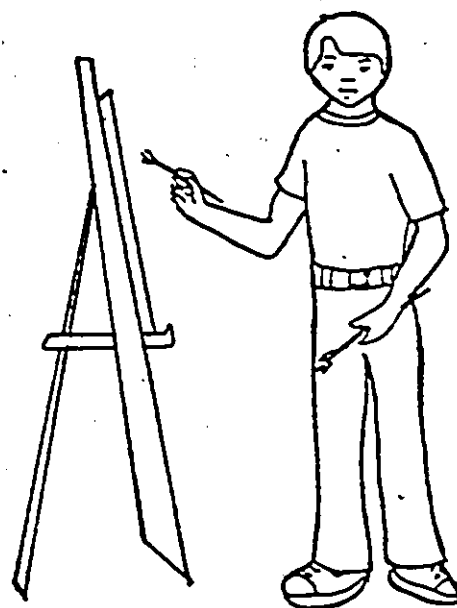
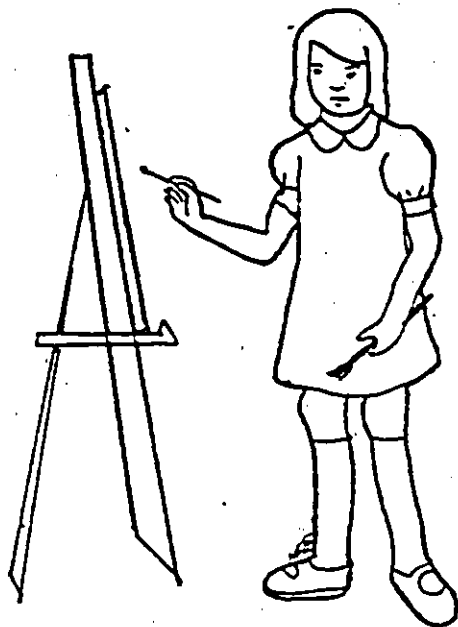
## Feminine Activities



## Feminine Activities



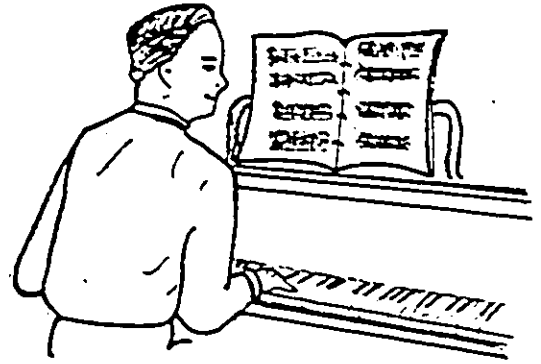
## Neutral Activities



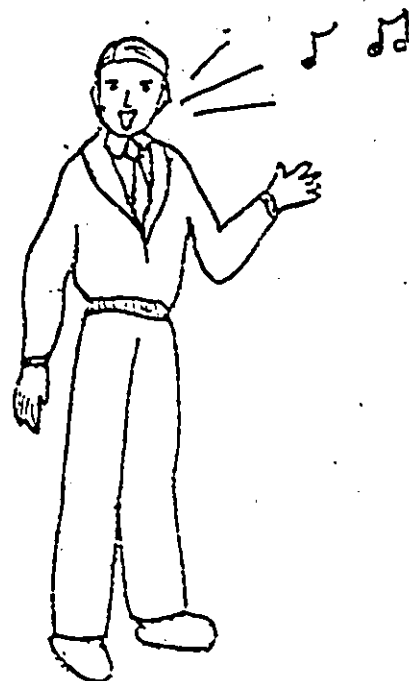
## Neutral Activities



## Filler Pictures



## Filler Pictures



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VITA AUCTORIS

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